Three dimensional nonlinear temperature and structural analysis of roller compacted concrete dam

ABSTRACT

This paper focuses on the development, verification and application of a three-dimensional finite element code for coupled thermal and structural analysis of roller compacted concrete dams. The Kinta RCC gravity dam, which is the first roller compacted concrete dam in Malaysia, has been taken for the purpose of verification of the finite element code. The actual climatic conditions and thermal properties of the materials were considered in the analysis. The structural stress analysis was performed using the elasto-plastic stress analysis. The Mohr yield criterion which is widely used for concrete plasticity modeling was adopted in this study. The results have shown that, the elasto-plastic analysis can redistribute the state of stresses and produces a more realistic profile of stresses in the dam.

Keyword: Elasto-plastic analysis; Finite element modeling; Roller compacted concrete dams